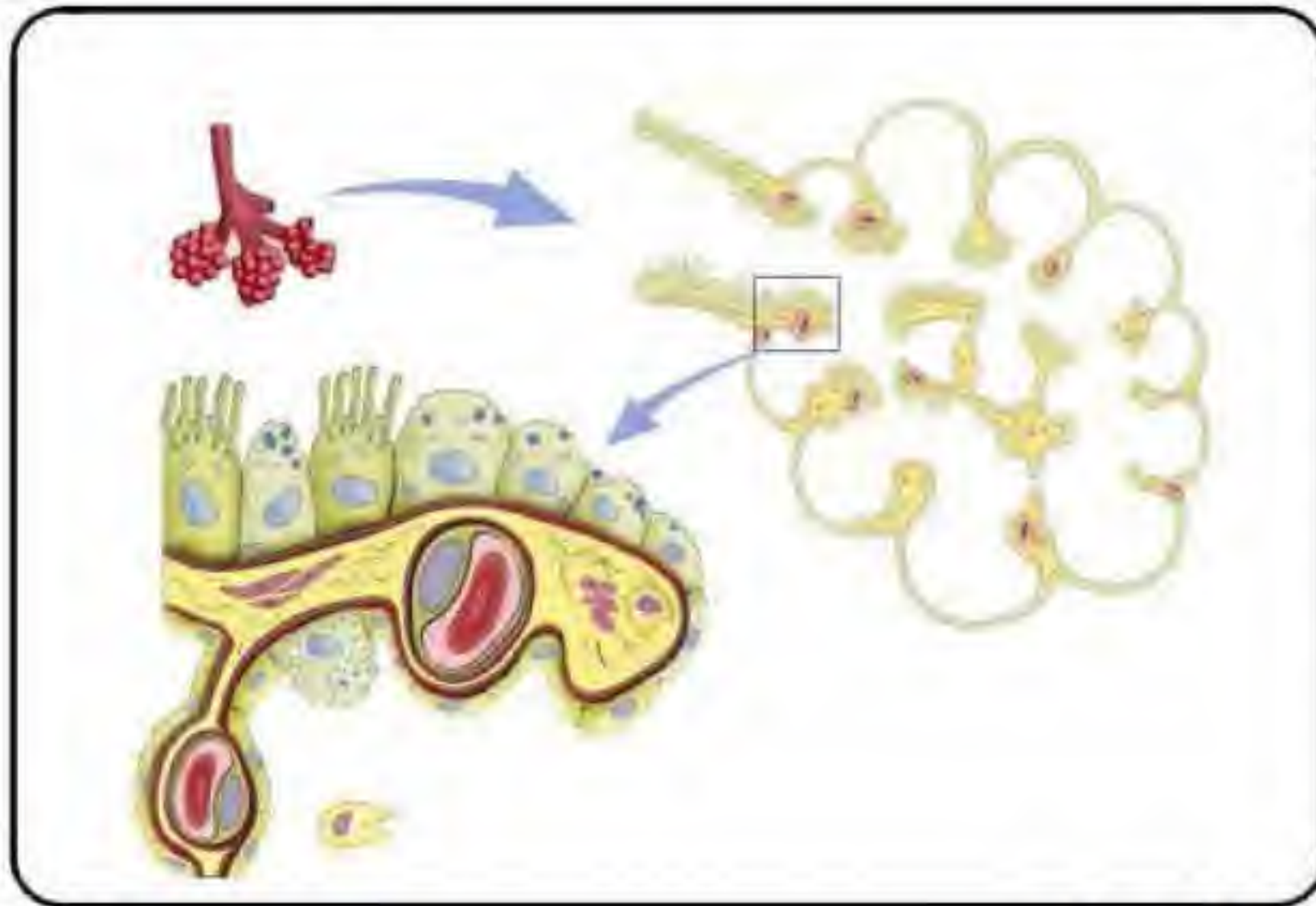


# Histology Mind Maps



## Respiratory System



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**WWW.MEDADTEAM.ORG**

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# Respiratory system

respiratory portion

conducting portion

function

gas exchange

functions

conducting

conditioning

CLEANING BY CILIA & GOBLET CELLS

warming by vascularity

moisten by mucous

include

respiratory epith

fetal lung

includes

LUNG

respiratory bronchioles

alveolar duct

alveolar sac

alveoli

alveolar phagocytes

dust cells

heart failure cells

blood - air barrier

interalveolar septa

olfactory mucosa

epith

sensory cells

sustentacular

basal

c.t corium

ciliated columnar cells

mucous goblet cells

brush cells

basal

neuroendocrine

nasal cavity

vestibule

nasal fossa

olfactory area

formed by olfactory mucosa ( epith + c.t corium )

paranasal sinus

nasopharynx

larynx

vocal cord

trachea

bronchial tree

extra pulmonary bronchi (1ry)

intrapulmonary bronchi (2ry)

bronchioles

terminal bronchioles



- 2 pairs of fold that extend in lumen of larynx
- upper pair ( false pair ) > respiratory epith > protect from foreign particles
- lower pair ( true pair ) > **non . kr . str . sq . epith**

**vocal cord**

**nasal cavity**

- hairy **kr . str.sq.epith**
- deeper : **non kr . str.sq epith**

- middle , inferior choncae lined by : respiratory epith
- **superior** lined by : **olfactory epith**

- thin tube walled about 10 cm long
- kept open by : 20 C chaped incomplete rings of hyaline cartilage

**trachea**

**olfactory area**

- roof of nasal cavity
- formed by olfactory mucosa ( epith + c.t corium )

- 1/ mucosa
  - A/ epithelium(respiratory)
  - b/ lamina propia
  - c/ elastic membrane

2/ submucosa

3/ fibrocartilaginous coat

4/ adventitia  
trachialis muscle& fibro  
elastic ligament

formed by

**paranasal sinus**

- closed cavities around nose & eyes
- lined by respiratory epith but :
  - 1/ thinner epith and fewer goblet cells
  - 2/ thinner corium and fewer mucous glands ( adherent to periosteum )

**nasopharynx**

- 1<sup>st</sup> part of phrynx
- respiratory epith
- c.t contain mucous gland and **pharengeal tonsils**

**conducting portion**

functions

- 1/ **conducting**
- 2/ **conditioning** :
  - A / warming by vascularity
  - b/ moisten by mucous

**CLEANING BY CILIA & GOBLET CELLS**

**larynx**

- irregular tube connect pharynx with trachea
- kept open by : **laryngeal cartilages** :
  - A / large (**hyaline**) : thyroid , cricoids
  - b/ smaller (**elastic**) : epiglottis , cuniform , corniculate
- lined by respiratory epith except :
  - 1/ vocal cord
  - 2/ ant . surface of epiglottis > **str.sq . epith**
- **FUNCTIONS** :
  - 1/production of voice
  - 2/prevention of foreign bodies from entering respiratory passages

**bronchial tree**

extra pulmonary bronchi (1ry)

- same structure as trachea
- continue in the hilum as intra pulmonary bronchi

intrapulmonary bronchi (2ry)

- 1-mucosa : respiratory epithelium
- 2- no sub mucosa
- 3- muscosa: spiral layer of smooth muscle
- 4- adventitia:multiple irregular plates of hyaline cartilage

**bronchioles**

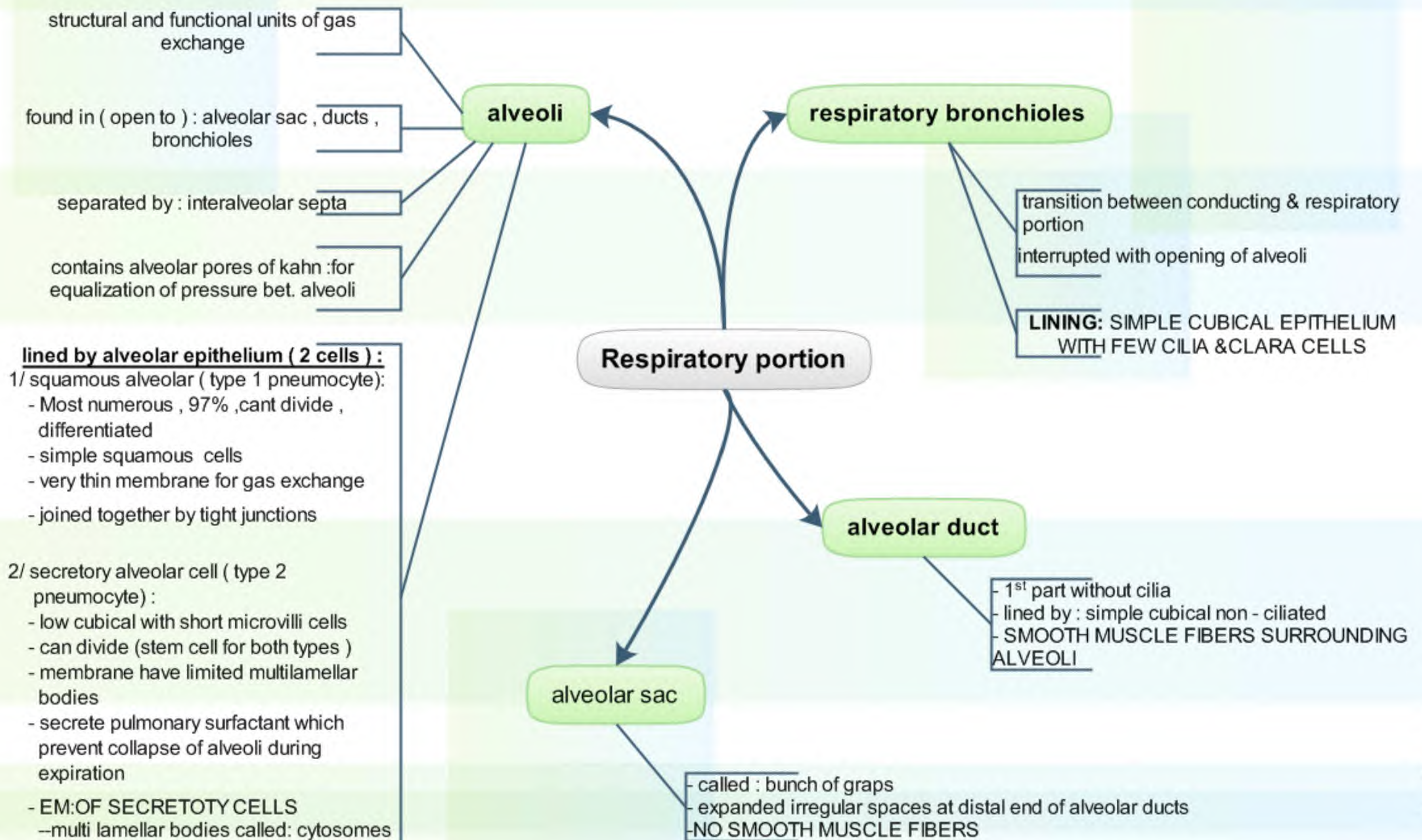
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**terminal bronchioles**

same as bronchioles except : lined by :  
**cub.ciliated with clara cells**

- formed by
  - 1/mucosa : **sim.col.ciliated** with clara cells ( **no goblet** )
  - 2/ muscosa : **circularly** arranged smooth muscle
  - 3/ outer layer : **NO cartilages , glands , lymphatics**







## respiratory epithelium pseudo.str.col.ciliated with goblet cells ( 5 cells )

### ciliated columnar cells

- most abundant
- cytoplasm contains basal bodies & numerous mitochondria

### mucous goblet cells

secrete mucous > cover the epithelium & traps bacteria from inspired air

### brush cells

- columnar with apical microvilli, basal afferent nerve endings
- appear as sensory receptor

### basal cells

act as stem cells

### neuroendocrine

scattered, numerous granules with dense core

## olfactory mucosa formed by

### olfactory epithelium

pseudo.str.ciliated with no goblet cells ( 3 cells )

#### olfactory sensory cells

- bipolar nerve cells
- 6-8 non-motile long cilia

#### sustentacular

- all columnar with wide cylindrical apices & narrow bases
- provided with microvilli immersed in a fluid layer
- yellow pigmented cytoplasm give the mucosa its color

#### basal cells

- small pyramidal cells present in the deepest zone of the epithelium
- act as stem cells for both types

#### C.T lamina propria (corium)

contain Bowman's glands: secrete a serous fluid that act as solvent for odorous gases

## interalveolar septa

- delicate partition separating alveoli with abundant blood capillaries
- supported by elastic & reticular fibers
- contain extravasated leucocytes ( monocyte ) & C.T cells

## blood air barrier

VERY THIN : 0.1 - 1.5 MICRON  
structures crossed by O<sub>2</sub> and CO<sub>2</sub> to be exchanged

- 1/ pulmonary surfactant
- 2/ cytoplasm of type 1 pneumocyte
- 3/ fused basal lamina between type 1 & capillary endothelium
- 4/ endothelial cells of blood

## alveolar phagocytes

- arise from monocyte escaping from blood capillaries to enter the C.T
- MACROPHAGE WITH ENGULFED PARTICLES MAY BE SEEN BULGING FROM INTERALVEOLAR WALL OR FREELY IN THE ALVEOLAR AIR SPACE
- 2 TYPES : 1/ DUST CELLS 2/ HEART FAILURE CELLS

brick red colour due to phagocytosed erythrocytes

## FETAL LUNG

- NO FUNCTION IN FETUS >> COLLAPSED IN THE INTRUTERINE LIFE
- LOBES & LOBULES ARE CLEAR DUE TO THICK C.T SEPTA
- ALVEOLI ARE COLLAPSED AND LINED BY SIMPLE CUBICAL EPITHELIUM
- CARTILAGE PLATES ARE PRESENT AROUND THE BRONCHI >>> DIFFERENTIATED FROM AGLAND
- PULMONARY BLOOD VESSELS ARE FULL OF BLOOD

## CLARA CELLS

- DOME SHAPED, FREE CELLS CILIA
- SECRETE SURFACTANT LIKE MATERIAL
- PROTECT AGAINST : 1/ EMPHYSEMA 2/ HARMFUL SUBSTANCE INHALED
- ACT AS STEM CELL
- EM: APICAL SER & BASAL RER --SECRETORY VESICLES--TIGHT JUNCTIONS